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EXAMINER
UHLIR, NIKOLAS J

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Please find below and/or attached an Office communication concerning this application or proceeding.

A317

Office Action Summary	Application No. 09/747,955	Applicant(s) IIJIMA, TADAYOSHI
	Examiner Nikolas J. Uhlir	Art Unit 1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6,16-18,20-30 and 32-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6, 16-18, 20-30 and 32-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *13* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This office action is in response to the request for continued examination (RCE) dated 1/7/03. The amendment dated 11/15/02 has now been entered. It is noted that claims 1-3, 6, 16-18, 20-30 and 32-34 are pending.

2. After careful consideration of applicants amendments and arguments, the prior rejection under USC 112 1st paragraph is hereby withdrawn, as applicant has removed the negative limitation from the claims that was the basis for this rejection. Further, the prior rejection of claims 1-6 and 29-34 over US patent #5935717 is hereby withdrawn. Applicant in his amendment has established the criticality of the pressure treatment step to obtaining the properties of the invention. As Oishi is devoid of any references as to forming a compressed functional film, the rejection is untenable.

3. The prior rejection of claims 17, 21-22, and 24-28 over JP10258486 to Kimura et al. is hereby withdrawn. The applicant has established on the record the criticality of the $44N/mm^2$ pressure-treating step. As Kimura is silent as to how much pressure is applied to the films in its invention, the rejection is untenable and is thus withdrawn.

4. Last after careful consideration, the rejection of claims 17-20 and 23 over EP0297678 to Parr et al. is hereby withdrawn. However, the Parr reference is now considered to read on many of the other claims pending in the application. A detailed explanation of how this reference reads on the instant claims follows below, along with a new grounds for rejection over a separate US patent.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 6, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Parr et al. (EP0297678)

7. Regarding the limitations of claim 1, wherein the applicant requires a functional film comprising a compressed layer of functional fine particles obtained by compressing a layer containing the functional fine particles that is formed by application onto a support with a compression force of at least $44N/mm^2$, wherein the functional film exhibits a functionality selected from the group listed.

8. For the purpose of this examination, the examiner interprets claim 1 to not require a support, as claim 1 as written merely requires a functional film that is made by the specified method, and does not positively recite that a substrate is required in the end product. However, the process as claimed in claim 1 has been established on the record to impart certain material and functional characteristics that are not obtained by a film that is not compressed to the requisite degree. Thus, the examiner has taken into consideration that a functional film of the prior art must have undergone the required pressure treatment in order to read on the applicant's claims.

9. The limitation(s) "said functional film being selected from the group consisting of a magnetic film, a ferromagnetic film, a dielectric film, a ferroelectric film, an

electrochromic film, an electroluminescent film, an insulating film, a light absorbing film, a light selecting absorbing film, a reflecting film, a reflection preventing film, a catalyst film, and a photocatalyst film" in claim 1 are intended use limitations and do not appear to be further limiting in so far as the structure of the product is concerned. "[I]n apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02.

10. Regarding the limitations of claim 1, Parr et al. teaches a method for forming a conductive layer of metal on a substrate. This method comprises depositing small metal particles onto a substrate and exposing them simultaneously to pressure and heat (column 1. line 53-column 2, line 2). The particles are typically nickel or copper which have a particle size preferably below 10 μm and are preferably lamellar in shape (column 2, lines 13-26). After the particles are deposited on the support, pressure of 5-100 MPA (5-100 N/mm^2) is applied to deform the particles (column 4, lines 51-57). Heat is applied to render the coating conductive (column 5, lines 6-12). Although not expressly stated, it is well known in the art that metal thin films can be used as reflecting films such as mirrors. Accordingly, the examiner takes the position that the film of Parr

et al. is capable of being utilized as a reflecting film. Thus, the limitations of claim 1 are met.

11. Regarding claim 2, wherein the applicant requires said layer containing said functional fine particles to be formed by applying a liquid containing the functional fine particles onto a support and drying the support. The limitation of claim 2 are product-by-process limitations and do not appear to be further limiting in so far as the structure of the product is concerned. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113. It has not yet been established on the record that the method limitations of claim 2 impart any structural or material difference to the applicant's claimed final product. Thus, the film of Parr et al. which forms the metal particles onto the support via any means which will achieve a uniform layer of particles (column 4, lines 1-9) reads on applicants limitations.

12. Regarding claim 3, wherein the applicant requires the functional fine particles to be inorganic particles. This limitation is met as set forth above for claim 1, as nickel and copper are inorganic.

13. Regarding claim 6, wherein the applicant requires the support to be a film of resin. For the record, it is noted that claim 1 in fact does not require the support to be

present in the final product, and thus, the limitations of claim 6 are product by process limitations that do not appear to be further limiting as far as the structure of the product is concerned. Applicant is referred to paragraph 10 for the recitation of the pertinent case law. However for the sake of completeness, Parr teaches that the support onto which the nickel or copper film is formed is adventitiously selected from a wide variety of polymeric materials, as shown at column 3, lines 15-38. The examiner interprets "resin" in claim 6 to include polymeric materials. Accordingly the limitations of this claim are met.

14. Regarding claim 16, wherein the applicant requires a functional film on a support, wherein the functional film comprises a compressed coating layer of functional fine particles, wherein the compressed coating layer has been compressed at a pressure of at least $44N/mm^2$ and has one of the functionalities listed. It is noted that the limitations of claim 16 are substantially the same as those of claim 1, except that claim 16 positively recites that the film a support is present. These limitations were previously addressed as detailed above for claim 16.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1-3, 6, 16-18, 20-30 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukinobu et al. (US5411792).

17. Regarding the limitations of claim 1, Yukinobu et al. (hereafter Yukinobu) teaches a method for making a transparent conductive film, wherein a coating solution containing ultrafine particles of a conductive oxide is formed onto a support, and the layer is dried and rolled with a steel roller (columns 2 and 3, lines 65-5) to form a transparent conductive film. Yukinobu teaches many examples wherein the film possess a light transmittance values of ~80-85%, as shown in tables 1-5. Thus, at least 15% of incident light on the films of Yukinobu is reflected or absorbed, as it is well known in the art that Transmittance= 1-refllectance-absorbance. Thus, the examiner takes the position that the films of Yukinobu could serve as reflecting or absorbing films. Further, it noted that each of the films of Yukinobu has a surface resistance value of at least 10Ω/□, and many with surface resistivity ~100Ω/□. Thus, as the films of Yukinobu are not purely conducting (surface resistivity= 0Ω/□), the examiner takes the position that the films of Yukinobu could serve as dielectric films, albeit ones that may exhibit very high dielectric constants.

18. Regarding applicants required pressure treatment step. Yukinobu et al. teaches many specific embodiments (examples 15-20) wherein a ITO containing ink is applied to the surface of a polyimide film to form a coating, after which the resulting film was heat treated, a further ITO containing dispersion is coated over the surface and dried, after which the film is subsequently rolled with a steel roller at a linear pressure of 100kgf/cm, 200kgf/cm, and 300kgf/cm. Unfortunately, without the compression length, the pressure utilized by Yukinobu (kgf/cm) cannot be converted to the applicants claimed units (N/mm^2). However, Referring to table 5 of Yukinobu, it is evident that as the roller

pressure increases, the surface resistance and light transmission of the film of the film decreases. Thus, the examiner takes the position that the pressure exerted on the functional film is a results effective variable.

19. Therefore it would have been obvious to one of ordinary skill in the art to adjust the amount of pressure applied to the film of Yukinobu in order to obtain a film that exhibits a desired level of surface resistivity and light transmittance.

20. Regarding claim 2, although the limitations of claim 2 are product by process limitations as set forth above at paragraph 10 of this office action, for the purpose of completeness the examiner notes that Yukinobu teaches applying a solution containing the functional fine particles to the surface of the support and drying the liquid, as shown in examples 15-20.

21. Regarding claim 3, wherein the applicant requires the functional fine particles to be inorganic. Yukinobu teaches utilizing indium tin oxide (ITO) as functional fine particles, which is a known inorganic material.

22. Regarding claim 6, wherein the applicant requires the support to be a resin. Once again, claim 1 does not positively recite that the support must be present in the final product. However, for completeness, examples 15-20 clearly show that the support is a polyimide film, which the examiner interprets to read on applicants claimed "resin."

23. Regarding claim 16, wherein the applicant requires essentially the same limitations as claim 1, except that the support is positively recited in the final product. This limitation is met as set forth above for claim 1.

24. Regarding claim 17, wherein the applicant requires a conductive film comprising a compressed layer of conductive fine particles formed by application onto a support, wherein the compressed layer of conductive fine particles is obtained by compressing a layer containing the conductive particles that "optionally" comprises less than 3.7 parts by volume binder with respect to 100 parts by volume of the conductive fine particles onto the support with a compression force of at least $44N/mm^2$, at a temperature below the glass transition temperature of the support, wherein said conductive fine particles have a particle diameter $\geq$5nm but $\leq$100nm..

25. Once again it is noted that claim 17 does not positively recite that the support is present in the end product. Further, It is important to note that the limitation "optionally a binder resin in an amount of less than 3.7 parts by volume with respect to 100 parts by volume of said conductive fine particles" does not further limit claim 17, as the recited limitation is optional. Thus, a film containing **any** amount binder resin reads on this claim. It is further noted that the limitation, "at a temperature below the glass transition temperature of the support" is a product by process limitation that does not appear to be further limiting as far as the structure of the product is concerned. It has not yet been established on the record that compressing the conductive film at a temperature below the glass transition temperature of the support results in a materially or structurally different product. The applicant is referred to paragraph 10 of this office action for the citation of the pertinent case law.

26. In any case however, it is noted that Yukinobu teaches in examples 15-17 a method wherein a coating solution that contains ITO particles (known to be conductive)

and an acrylic binder resin is applied to a polyimide support. After this solution is applied to the support, the film is then heat treated at 400^{0}C, during which the acrylic resin is carbonized. Then the film is rolled under a linear pressure of 100, 200, or 300kgf/cm respectively to form a conductive film (see columns 13-14). Thus, as the acrylic binder resin of Yukinobu is carbonized, it is not present when the film is compressed, and thus meets applicants claimed resin binder content requirement. It is further noted that Yukinobu teaches that the conductive film comprises ITO particles that are 0.1μ (100nm) or smaller (column 2, lines 32-33).

27. With respect to the applicants limitation requiring the compression to occur at a temperature below the glass transition temperature of the support. According to the examiners reading of the method for embodiment 15 of Yukinobu, the process comprises a heating step wherein the coating is heated to 400^0. A compression step, and then another heating step wherein the film is once again heated at 400^0 C. Thus, the Method of Yukinobu suggests that the film is cooled before it is compressed, otherwise the film would not have to be heated a second time to 400^{0}C. Further, it is noted that the polyimide support utilized by Yukinobu is Kapton. The examiner retrieved a datasheet from http://www.dupont.com/kapton/general/H-38492-2.pdf (a copy accompanies this action) that establishes that the glass transition temperature of kapton lies "somewhere between 360^{0}C and 410^{0}C" as shown by page 3 of the document. Thus, even if the film of Yukinobu were heated to 400^{0}C, the support may still not be at the glass transition temperature.

28. Regarding claim 18, wherein the applicant requires the layer containing the conductive fine particles is formed by applying a liquid containing the conductive fine particles onto a support and drying the liquid. Although these limitations are product by process limitations as established above, it is noted that Yukinobu teaches the required method in embodiment 15.

29. Regarding claim 20, wherein the applicant requires the support to be made of resin. Yukinobu specifically teaches the use of a polyimide support, which the examiner interprets to read on applicants claimed "resin."

30. Regarding claim 21, wherein the applicant requires the compressed layer of conductive fine particles is impregnated with a transparent substance, whereby the film has a function as a transparent conductive film. Yukinobu in embodiment 15 teaches the required impregnation and function. Thus, this limitation is met.

31. With respect to claim 22, wherein the applicant requires the conductive particles to be selected from inorganic oxides including tin oxide, indium oxide, zinc oxide, cadmium oxide, antimony tin oxide, fluorine doped tin oxide, tin doped indium oxide, and aluminum doped zinc oxide. Yukinobu teaches the utilization of ITO particles (column 2, lines 22-35).

32. Regarding claim 23, wherein the applicant requires essentially the same limitations as claim 17, except that the support is positively recited in the end product. These limitations are met as set forth above for claim 17.

33. With respect to the limitations of claim 24, wherein the applicant requires a transparent conductive film that comprises a compressed layer of conductive fine

particles formed by application onto a support, wherein the compressed layer of conductive fine particles is obtained by compressing a layer containing the conductive fine particles and no binder resin onto the support, and then impregnating the layer with a transparent substance after compression.

34. The limitation "compressing a layer containing the conductive fine particles and no binder resin onto the support" is a product by process limitation that does not appear to be further limiting in so far as the structure of the product is concerned (see paragraph 10). It has not yet been established on the record that forming the conductive film by compressing a layer containing conductive particles and no binder resin results in a structural or material difference in the applicants claimed product. The examiner takes the position that embodiments 15-17 of Yukinobu, which teach coating a polyimide substrate with a solution containing ITO particles and a binder resin, carbonizing the resin binder that contains the ITO particles prior to compressing the film, followed by overcoating the film with a transparent substance reads on the limitations of claim 24 (see columns 13-14).

35. Regarding claim 25, wherein the applicant requires the layer containing the functional fine particles to be formed via a specific method. This limitation is met as set forth above for claims 2 and 24.

36. Regarding claim 26, wherein the applicant requires a the layer to be compressed with a pressure of at least $44N/mm^2$. This limitation is met as set forth above for claims 1 and 24.

37. Regarding claim 27, wherein the applicant requires the support to be made of resin. This limitation is met as set forth above for claim 24.

38. Regarding claim 28, wherein the applicant requires the conductive fine particles to be one of the materials listed. As stated above, Yukinobu utilizes ITO particles, thus meeting this limitation.

39. Regarding claim 29, wherein the applicant requires the particles to have a diameter of 50-100nm. As stated above for claims 17 and 23, Yukinobu teaches utilizing ITO particles that are less than 0.1μ in diameter. Thus this limitation is met.

40. Regarding claims 30 and 32-34, the limitations of these claims have been previously addressed as set forth above for claims 24, 25, 27, and 28 above.

Response to Arguments

41. The examiner carefully considered all of the applicants arguments related to the prior art applied. As many of those rejections have been withdrawn, the argument related to those references is moot. However, as the Parr et al. reference is still being relied upon, the examiner feels that it is necessary and beneficial to the prosecution of the instant application to discuss those arguments made by the applicant relating to this reference that are still pertinent.

42. With respect to Parr et al. the applicant presented the argument that Parr et al. does not read on the instant invention, as Parr specifically teaches utilizing a method wherein the film is heated to a point at which the polymer substrate is softened and compressed, whereas the method utilized by the instant invention compresses the film at a temperature below the glass transition temperature of the support. While the

examiner certainly acknowledges that the applicants arguments are true, the applicant is respectfully reminded that in claims ~~1~~3, 6, and 17, no requirement as to the compression temperature are required. Thus, with respect to the current rejection, the applicant's arguments are outside the scope of the limitations of claims 1-3, 6 and 16, and are thus unpersuasive.

43. The applicants further argue that the film of Parr et al. utilizes particles that are outside the size range of those utilized by the invention. However, claims 1-3, 6 and 16 require no such size limitation. Thus, the applicant's arguments with respect to the current rejection are unpersuasive as they are outside the scope of the limitations of claims 1-3, 6, and 16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

nju
March 12, 2003

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700